1 **GENERIC CONTROL SYSTEM, APPARATUS OR PROCESS**
2 .Plural processors
3 ..Master-slave
4 ..Parallel
5 ...Shared memory
6 ..Hybrid types (analog, digital)
7 ..Including sequence or logic processor
8 .Cascade control
9 .Supervisory control
10 ..Of analog controllers
11 .Sequential or selective
12 ..State of condition or parameter (e.g., on/off)
13 ...Position responsive
14 ...Time responsive (duration)
15 ....Having display
16 ....Clock-calendar (e.g., time of day)
17 ..Operator interface (e.g., display with control)
18 ...Specific programming (e.g., relay or ladder logic)
19 ..Plural controlled systems, mechanisms, or elements
20 ..Plural controllers
21 ..Failure protection or reliability
22 ..Electrical power distribution
23 ..Sequence program response
24 ...Addressing
25 ...I/O table
26 ...Diagnostics or debugging
27 ...Having status indication
28 .Optimization or adaptive control
29 ..Having model
30 ...Comparison with model (e.g., model reference)
31 ...Having adjustment of model (e.g., update)
32 ..Specific criteria of system performance
33 ...Constraint or limit (e.g., max/min)
34 ....Variable
35 ....Bidirectional (e.g., oscillatory)
36 ....Economic (e.g., cost)
37 ...Gain (e.g., tuning)
38 ..Having perturbation
39 ...Test signal
40 ..Plural modes
41 ...Proportional-Integral (P-I)
42 ....Proportional-Integral-Derivative (P-I-D)
43 ...Proportional-Derivative (P-D)
44 ..Feed-forward (e.g., predictive)
45 ...Combined with feedback
46 ..Rate control
47 ..Trainable system (e.g., self-learning, self-organizing)
48 ...Neural network
49 ..Expert system
50 ..Fuzzy logic
51 ..Statistical process control (SPC)
52 ..Parameter estimation or identification
53 ..Multiple input-multiple output (MIMO) system feature (e.g., decoupling)
54 ..Having particular compensation or stabilization feature
55 ...Filtering
56 .Digital positioning (other than machine tool)
57 ..Alignment or registration
58 ...Having position marking
59 ...Having optical sensing (e.g., image projection)
60 ..Support positioning (e.g., table, stage)
61 ..Multiple axis motion or path control
62 ...Orientation (e.g., posture, pose)
63 ...Including velocity or acceleration control
64 ...Position recording
65 ..Operator control of remotely located element
66 ..Having particular position determining apparatue (e.g., portable or handheld)
67 .Plural variables
68 ..Ratio
69 ..Positional (e.g., velocity, acceleration)
70 ...Positional with nonpositional
71 .Specific compensation or stabilization feature
72 ..Lag (e.g., deadtime)
73 .Sampled data system
74 ..Variable rate

75 .Multiple modes (e.g., digital/analog)
76 ..Manual/automatic
77 ..Fine/coarse
78 .Having specific error signal generation (e.g., up/down counter)
79 .Having protection or reliability feature
80 ..Warning or alarm
81 ..Self-test
82 ..Backup/standby
83 .Having operator control interface (e.g., control/display console)
84 ..Keyboard
85 ..Positional (e.g., joystick)
86 .Having preparation of program
87 ..Editing/modifying
88 ..Playback
89 .Having specific algorithm
90 **SPECIFIC APPLICATION, APPARATUS OR PROCESS**
91 .Contest or contestant analysis, management, or monitoring (e.g., statistical analysis, handicapping, scoring)
92 ..Scoring
93 ..Probability determination or handicapping
94 .Digital audio data processing system
95 .Product assembly or manufacturing
96 ..Integrated system (Computer Integrated Manufacturing (CIM)
97 ..Design or planning
98 ...3-D product design (e.g., solid modeling)
99 ...Resource allocation
100 ....Job scheduling
101 .....Priority ordering
102 .....Job release determination
103 ...Constraints or rules
104 ....Knowledge based (e.g., expert system)
105 ...Rework or engineering change
106 ...Material requirement
107 ....Bill of material
108 ..Performance monitoring
109 ...Quality control
110 ....Defect analysis or recognition
111 ...Worker or work station efficiency
112 ..Having particular work transport control between manufacturing stations
113 ...Mobile transport
114 ..Work positioning
115 ..Product tracking (e.g., having product or carrier identification)
116 ...Having identification controlled manufacturing operation
117 ..Particular manufactured product or operation
118 ...Three-dimensional product forming
119 ....Rapid prototyping (e.g., layer-by-layer, material deposition)
120 .....Stereolithography
121 ...Integrated circuit production or semiconductor fabrication
122 ...Continuous material having indeterminate length (e.g., web, strand, strip, or sheet)
123 ....Material deposition or application (e.g., spraying, coating)
124 ....Registration control
125 .....Having a reference mark or pattern
126 ....Winding
127 ....Sheet making (e.g., paper product)
128 .....Paper machine or subsystem control
129 .....Profile analyzer or controller
130 ...Textile
131 ....Pattern design
132 .....For a garment
133 .....Having particular pattern producing operation (e.g., dyeing)
134 ....Pattern cutting
135 ....Pattern matching or positioning
136 ....Sewing
137 .....Having particular input data (e.g., stitch)
138 .....Embroidering
139 ....Spinning or winding (e.g., yarn)

140 ....Loom control
141 ....Knitting
142 ....Fiber preparation
143 ....Having monitoring or inspecting (e.g., abnormality detection)
144 .....Yarn quality
145 ...Metal
146 ....Casting or drawing
147 .....Control of metallurgical property
148 ....Rolling
149 .....Having schedule adjustment
150 .....Control or detection of a particular condition
151 ......Speed control
152 ......Tension control (e.g., interstrand)
153 ......Temperature control
154 ......Flatness or crown control
155 ......Thickness control
156 ....Roll eccentricity compensation
157 ...Glassware forming
158 ....IS (individual section) machine
159 ...Machining
160 ....Having particular tool or tool operation
161 .....Tracing or duplicating
162 .....Electrical discharge machining (EDM)
163 .....3-D sculpturing using nontracing prototype sensor
164 .....Grinding
165 .....Bending (e.g., press brake)
166 .....Laser
167 ....Of elongated material (e.g., timber, veneer, web)
168 ....Portable (e.g., handheld)
169 ....Supervisory control (e.g., plural tools or plural processors)
170 ....Having particular control of a motor parameter
171 ....Material usage optimization
172 ....Multiple mode (e.g., rough-finish, coarse-fine)
173 ....Adaptive (optimizing) system
174 ....Performance monitoring
175 .....Condition of tool or workpiece (e.g., tolerance, tool wear)
176 ......Offsetting
177 .....Protective or diagnostic feature
178 ......Tool/workpiece interference prevention
179 ....Tool selection/change
180 ....Having operator interface feature
181 .....Specific programming format (e.g., macro)
182 .....Including CAD, CAM, or CIM technique
183 .....Preset pattern
184 .....Machining path display
185 .....Prompting technique
186 ....Digital positioning technique
187 .....For curve or contour
188 .....Including velocity or acceleration control
189 .....Interpolation
190 .....Specified tool feed path at entry or withdrawal
191 ......Repeated machining passes
192 .....Alignment of tool or workpiece (e.g., origin or path return)
193 .....Positional compensation or modification compensation or mod
194 ....Coordinate transformation technique
195 ....Having particular measuring device (e.g., probe)
196 ...Extruding
197 ...Molding
198 ....Control of curing
199 .....Vulcanization
200 ....Injection
201 .....Plural molding machines or stations
202 .....Control of temperature
203 .....Control of pressure
204 ....Monitoring, inspection, or control of a particular condition
205 .....Control of temperature
206 ...Pressing
207 ...Heating
208 ....Drying
209 ....Furnace
210 .....Multizone
211 ....Oven
212 ....Sintering, soldering, or bonding
213 .Article handling

214 ..Article storing, retrieval, or arrangement (e.g., warehousing, automated library)
215 ...Having an identification code
216 ...Order filling
217 ...Article support load management (e.g., palletizing)
218 ...Particular charging or discharging apparatus
219 ..Associating or disassociating plural articles
220 ...Inserting
221 ....Having an identification code
222 .....Monitoring or inspection (e.g., incomplete assembly)
223 ...Collating or sorting
224 ....Having an identification code
225 ..Having an identification code
226 ...Identification code determines article destination
227 ....Preparation of an article for an identification code (e.g., printing, encoding)
228 ..Having particular transport between article handling stations
229 ...Transport position identification
230 ...Having a conveyor
231 ..Dispensing or vending
232 ...Operator or payment initiated
233 ....Customized dispensed article (e.g., operator design)
234 ....Demonstration or duplication of article (e.g., software, video)
235 ....Printing on or of dispensed or vended article
236 ....Data collection or reporting (e.g., sales, inventory)
237 ....Authorization (e.g., password, time usage limit, personal identification number (PIN)
238 ....Price adjustment
239 ...Blending or mixing
240 ...Condition controlled dispensing (e.g., weight or volume)
241 ...Central control of plural dispensing units
242 ...Particular supply arrangement (e.g., plural sources or compartments)
243 ....Movable (e.g., rotatable)
244 ...Monitoring or inspection
245 .Robot control
246 ..Combined with knowledge processing (e.g., natural language system)
247 ..Plural controlled devices or plural nonvision controlling devices
248 ...Plural robots
249 ...Plural processors
250 ..Specific enhancing or modifying technique (e.g., adaptive control)
251 ...Coordinate transformation
252 ...Interpolation
253 ...Programmed data (e.g., path) modified by sensed data
254 ...Compensation or calibration
255 ...Collision prevention
256 ...Overload prevention
257 ...Based on user input
258 ..Having particular sensor
259 ...Vision sensor (e.g., camera, photocell)
260 ..Having control of force
261 ...Having control of robot torque
262 ..Using particular manipulator orientation computation (e.g., vector/matrix calculation)
263 ...Using Jacobian computation
264 ..Having particular operator interface (e.g., teaching box, digitizer, tablet, pendant, dummy arm)
265 .Nonreactive mixing process (e.g., mixing cement, preparing solution, diluting chemical)
266 .Chemical process control or monitoring system
267 ..Titration or pH level
268 ..Synthesis process
269 ...Polymerization/trimerization
270 ..Distillation
271 ..Refinement or purification or rejuvenation
272 ...Of fuel
273 ..Separation process
274 ..Control of combustion or heating apparatus (e.g., kiln, furnace, autoclave, burner, combusion system)
275 .Mechanical control system
276 ..HVAC control

277 ...Multiple zones
278 ...Specific thermally responsive controller
279 ..Balancing or alignment
280 ..Vibration or acoustic noise control
281 ..Control of fluid level or volume
282 ..Flow control (e.g., valve or pump control)
283 ...Dispensing management (e.g., spraying)
284 ....Irrigation
285 ...Fluid mixing
286 .Electrical power generation or distribution system
287 ..Turbine or generator control
288 ...Cogenerative system
289 ...Adaptive valve control
290 ....For turbine speed control
291 ..Energy consumption or demand prediction or estimation
292 ..System protection (e.g., circuit interrupter, circuit limiter, voltage suppressor)
293 ...Abnormal power, current, or impedance condition
294 ...Abnormal phase, waveform, or polarity condition
295 ..Power allocation management (e.g., load adding/shedding)
296 ...Time based control (e.g., real time or duty cycle)
297 ..Power supply regulation operation
298 ...By voltage regulation
299 .Specific application of temperature responsive control system
300 ..For heating or cooling
301 .Specific application of pressure responsive control system
302 .Specific application of positional responsive control system
303 .Specific application of dimensional responsive control system
304 .Specific application of speed responsive control system
305 .Specific application of weight responsive control system
306 .Specific application of control based on elapsed time

CROSS-REFERENCE ART COLLECTIONS

900 **SPECIAL ROBOT STRUCTURAL ELEMENT**

FOREIGN ART COLLECTIONS

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collection listed below. These collections contain ONLY foreign patents or nonpatent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

FOR 000 **CLASS-RELATED FOREIGN DOCUMENTS**
FOR 101 **SEQUENTIAL OR SELECTIVE DATA PROCESSING CONROL SYSTEM, METHOD, OR APPARATUS (364/140)**
FOR 102 **OPTIMIZATION OR ADAPTIVE DATA PROCESSING CONTROL SYSTEM, METHOD, OR APPARATUS (364/148)**
FOR 103 **DIGITAL POSITIONING (OTHER THAN MACHINE TOOL) CONTROL SYSTEM, METHOD, OR APPARATUS (364/167.01)**
FOR 104 **GAME OR AMUSEMENT (364/410)**
FOR 105 .Scoring (364/411)
FOR 106 .Wagering (364/412)